

What is claimed is:

- 1 1. A wire feeder for feeding wire from a
2 source of wire in a welding system comprising:
3 at least one stepper motor disposed adjacent
4 the wire and disposed to drive the wire;
5 wire feed motor disposed along a wire path
6 from the source to a welding torch, wherein the torch
7 is closer to the at least one stepper motor than the
8 torch is to the wire feed motor, and wherein the wire
9 feed motor is disposed to contact the wire and move the
10 wire from the source to the torch; and
11 the at least one stepper motor is disposed to
12 retard movement of the wire toward an arc end of the
13 torch.

- 14 2. The wire feeder of claim 1, wherein the at
15 least one stepper motor is disposed to slow the movement of
16 the wire.

- 1 3. The wire feeder of claim 1, wherein the at
2 least one stepper motor is disposed to stop the movement of
3 the wire.

- 1 4. A wire feeder for feeding wire from a
2 source of wire to a weld, comprising a pair of motors
3 disposed on opposite sides of the wire and disposed to
4 move the wire to an arc end of a torch, and to retard
5 movement of the wire to an arc end of the torch.

- 1 5. The wire feeder of claim 4, wherein the pair
2 of motors is disposed to slow the movement of the wire.

1 6. The wire feeder of claim 4, wherein the pair
2 of motors is disposed to stop the movement of the wire.

1 7. The wire feeder of claim 6, wherein the pair
2 of motors are disposed along a wire path from the source to
3 the torch, adjacent the torch.

1 8. The wire feeder of claim 4, wherein the pair
2 of motors are disposed along the wire path closer to the
3 torch than to the source.

1 9. The wire feeder of claim 4, further
2 comprising a wire feed motor disposed along the wire path,
3 closer to the source than to the torch, and disposed to
4 contact the wire and move the wire from the source to the
5 torch.

1 10. The wire feeder of claim 4, wherein the
2 source includes a reel of wire mounted without a wire feed
3 motor adjacent thereto.

1 11. The wire feeder of claim 4, wherein the pair
2 of motors are disposed directly opposite one another.

1 12. The wire feeder of claim 7, wherein the pair
2 of motors are stepper motors.

1 13. The wire feeder of claim 4, wherein the pair
2 of motors are disposed one after the other.

1 14. The wire feeder of claim 4, wherein the pair
2 of motors are servo motors.

1 15. The wire feeder of claim 2, wherein the pair
2 of motors are zero backlash motors.

1 16. The wire feeder of claim 2, wherein the pair
2 of motors are gearless motors.

3 17. The wire feeder of claim 2, wherein the pair
4 of motors are dc motors.

1 18. A wire feeder for feeding wire from a
2 source of wire to a weld, comprising:

3 a wire feed motor disposed along a wire path
4 and disposed to contact the wire and move the wire from
5 the source to a torch; and

6 at least one linear actuator disposed
7 adjacent the wire and disposed to retard movement of
8 the wire to an arc end of the torch.

1 19. The wire feeder of claim 1, wherein the at
2 least one linear actuator motor is disposed to slow the
3 movement of the wire.

1 20. The wire feeder of claim 1, wherein the at
2 least one linear actuator motor is disposed to stop the
3 movement of the wire.

1 21. The wire feeder of claim 13, wherein the at
2 least one linear actuator is disposed along the wire path
3 closer to the torch than to the source.

1 22. The wire feeder of claim 14, wherein the at
2 least one linear actuator is disposed along the wire path
3 adjacent the torch.

1 23. A method of providing wire from a source
2 to a weld in a welding system comprising:

3 driving the wire to a torch with a wire feed
4 motor; and

5 superimposing, onto motion imposed by the
6 wire feed motor, motion of the wire between the wire
7 feed motor and the weld, with at least one stepper
8 motor, wherein the stepper motor retards movement of
9 the wire to the torch, and accelerates movement of the
10 wire to the torch.

1 24. The wire feeder of claim 1, wherein the at
2 least one stepper motor is disposed to slow the movement of
3 the wire.

4 25. The wire feeder of claim 1, wherein the at
5 least one stepper motor is disposed to stop the movement of
6 the wire.

1 26. The method of claim 16, further comprising
2 disposing the at least one stepper motor along a wire path
3 from the source to the torch, and near the torch.

1 27. The method of claim 17, further comprising
2 disposing the at least one stepper motor along a wire path
3 from the source to a welding torch, and adjacent the torch.

1 28. The method of claim 16, wherein driving the
2 wire includes moving the wire to an arc end of the torch,
3 and retarding the movement of the wire to the arc end of
4 torch.

1 29. A method of providing wire from a source
2 to a weld in a welding system comprising driving the

3 wire with a pair of motors disposed on opposite sides
4 of the wire and moving the wire to an arc end of a
5 torch, and retarding movement of the wire to the arc
6 end of the torch.

1 30. The wire feeder of claim 1, wherein the pair
2 of motors is disposed to slow the movement of the wire.

1 31. The wire feeder of claim 1, wherein the pair
2 of motors is disposed to stop the movement of the wire.

1 32. The method of claim 20, further comprising a
2 driving the wire with a wire feed motor disposed closer to
3 the source than to the torch.

1 33. A method of providing wire from a source
2 to a weld in a welding system comprising driving the
3 wire to a torch with at least one gearless motor for
4 moving the wire to an arc end of the torch, and
5 retarding movement of the wire to the arc end of the
6 torch.

1 34. The method of claim 22, further comprising
2 driving the wire with a wire feed motor disposed along a
3 wire path from the source to a welding torch, closer to the
4 source than to the torch.

1 35. A method of providing wire from a source
2 to a weld in a welding system comprising driving the
3 wire to an arc end of a torch with at least one servo
4 motor for moving the wire to the arc end of the torch
5 and retarding movement of the wire to the arc end of
6 the torch.

1 36. The method of claim 24 further comprising
2 driving the wire with a wire feed motor disposed along a
3 wire path, closer to the source than to the torch.

1 37. A method of providing wire from a source
2 to a weld in a welding system comprising driving the
3 wire to an arc end of a torch with at least one zero
4 backlash motor for moving the wire to the arc end of
5 the torch and retarding movement of the wire to the arc
6 end of the torch.

1 38. The method of claim 26, further comprising
2 driving the wire with a wire feed motor disposed along a
3 wire path, closer to the source than to the torch.

1 39. A method of providing wire from a source to a
2 weld in a welding system comprising:
3 driving a wire to a torch using a wire feed motor;
4 retarding the movement of the wire to an arc end
5 of a torch with at least one linear actuator.

1 40. A method of providing wire from a source
2 to a weld in a welding system comprising driving the
3 wire to, and retarding the movement to an arc end of a
4 torch within one process cycle.

1 41. The method of claim 29, wherein retarding
2 includes slowing the movement.

1 42. The method of claim 29, wherein retarding
2 includes stopping the movement.

1 43. A wire feeder for feeding wire from a
2 source of wire in a welding system comprising:

3 means for feeding wire from the source to a
4 weld; and

5 means for driving the wire to or retarding
6 movement to an arc end of a torch within one process
7 cycle.

1 44. The system of claim 30, wherein the
2 means for driving includes at least one stepper motor and a
3 wire feed motor.

1 45. The system of claim 30, wherein the
2 means for driving includes at least one servo motor.

1 46. The system of claim 32, wherein the
2 means for driving includes at least one planetary drive.

1 47. The system of claim 33, wherein the
2 means for driving includes at least one linear actuator.

1 48. A wire feeder for feeding wire from a
2 source of wire in a welding system comprising:

3 means for feeding wire from the source to a
4 weld; and

5 means for moving the wire to and retarding
6 movement to an arc end of a torch, disposed on opposite
7 sides of the wire.

1 49. A wire feeder for feeding wire from a
2 source of wire in a welding system comprising:

3 at least one dc motor disposed adjacent the
4 wire and near the torch; and

5 wherein the at least one dc motor is disposed
6 to advance the wire toward an arc end of the torch and

7 to retard movement of the wire toward the arc end of
8 the torch.

1 50. The wire feeder of claim 36 wherein the dc
2 motor is a direct drive dc motor.

1 51. The wire feeder of claim 36 wherein the dc
2 motor is a brushless dc motor.

1 52. A method of providing wire from a source
2 to a weld in a welding system comprising driving the
3 wire to a torch with at least one dc motor for moving
4 the wire to an arc end of the torch, and retarding
5 movement of the wire to the arc end of the torch.

1 53. A method of providing wire from a source
2 to a weld in a welding system comprising driving the
3 wire to a torch with at least one dc brushless motor
4 for moving the wire to an arc end of the torch, and
5 retarding movement of the wire to the arc end of the
6 torch.

1 54. A method of arc welding, comprising:
2 providing pulse welding power to a welding
3 arc;
4 moving wire to the arc, wherein the wire is
5 consumed in the arc;
6 monitoring the arc, to determine when a short
7 occurs; and
8 retarding the motion of the wire in the event
9 a short is detected.

1 55. The method of claim 54, wherein retarding is
2 slowing.

1 56. The method of claim 54, wherein retarding is
2 stopping.

1 57. The method of claim 54, wherein retarding is
2 reversing.

1 58. A method of arc welding, comprising:
2 providing pulse welding power to a welding
3 arc, including a peak current phase and a background
4 current phase;
5 moving wire to the arc, wherein the wire is
6 consumed in the arc;
7 retarding the motion of the wire in at least
8 a part of one of at least one of the peak and
9 background phases.

1 59. The method of claim 58, wherein retarding is
2 slowing.

1 60. The method of claim 58, wherein retarding is
2 stopping.

1 61. The method of claim 58, wherein retarding is
2 reversing.